

The Development of *Snake Ladder* Game Media in Compound's Nomenclature Subject for Tenth Graders at SMAN 16 Banda Aceh

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Abstract

This study aims were to: (1) examine the expediency of *snake ladder* game media (2) know students' learning outcome, (3) evaluate the students' response towards the developed *snake ladder* game media in compound's nomenclature subject. The research type used was Research and Development (R&D) with ADDIE development model. Data collection techniques used was media expediency questionnaire, observation, the cognitive test, and students' response questionnaire. The research's instruments used were media expediency questionnaire sheet, students' activity observation sheet, test questions, and students' response questionnaire sheet. The study results were obtained (1) the average percentage of media expediency questionnaire sheet from two validators was 100% which was in very proper category, (2) classically, the percentage of students' who gained mastery level was 80%, and 3) the average percentage of students' response was 81,87% within very well category. To conclude, *snake ladder* game media could increase students' performance on the subject of compound's nomenclature.

Keywords: Snake Ladder game media, learning outcome, compound's nomenclature.

Introduction

Learning is prominent activity in education at school as learning process has educative value with the involvement of interaction between teachers and their students. This is due to the learning activities done were headed to attain the set learning outcomes (Djamarah & Aswan, 2010). Chemistry is one of the preliminary science subjects that have a vital role in human life. Chemistry can be defined as a science that study about structure, properties, substance change, and energy that follows the changed (Purba, 2006). One of the (inorganic) chemistry lessons taught for students at tenth graders in the second semester is compound's nomenclature. This subject is considered as a difficult subject to learn as it requires the students to memorize the nomenclature rules as a whole, be careful of the rules for five different types of inorganic compound and the rules for simple organic compound (i.e. hydrocarbon and its derivate) (Slamet & Rusly, 2016).

Based on the observation result done at SMAN 16 Banda Aceh during in-service training from February to June 2016, it was obtained that the learning process has followed 2013 curriculum; however, in the instructional process the teacher rarely used learning media. The teachers have only used text book and student' worksheet

(LKPD) and leads to not meaningful learning experiences for students. This was true as at daily test in the academic year of 2016/2017 many students have not reached mastery learning criteria (KKM) of 60 for compound's nomenclature subject. The number of students who were uncompleted was 13 out of 18 while the rest were completed (27%). This was supported by the result of the national test (UN) for the academic year of 2015/2016 that has been come out by BSNP with the average percentage of 44,19% were in complete criteria while the rest were uncompleted in the subject of inorganic chemistry. This was happened might be due to the students were less motivated to learn. One of the ways to solve this problem was by using *snake ladder* game media. This game media can enhance the students' attraction and attention to the lesson so that their activities in learning were increased as well. The activities involved including each student actively do the exercise in the form of question cards and receive point and reward if the group of students win during the game.

Seftina (2012) argued that Team Game Tournament (TGT) learning model with the help of *snake ladder* learning media on the subject of reduction and oxidation reaction could increase the average percentages of students' conceptual understanding from 51.72% to 77.54%, students' social skills of 91.43% and students' response of 97.14%. In addition, Linda (2014) stated that the use of *snake ladder* game as chemo-edutainment media could achieve students' mastery of attitude competency of 100%, mastery of cognitive competency of 87.87%, and mastery of skill competency of 100% on the topic of substance periodic system in class X MIA SMAN 2 Tanah Putih. Further, Papuli, Haryono, and Nanik (2016) also noted that *snake ladder* learning media can improve students' cognitive outcome better as $t_{\text{count score}} (7.7405) > t_{\text{table}} (2.0017)$ on the subject of colloid system.

Literature Review

Wati (2016) and Sanjaya (2012) argued that the function of the learning media that are it can: (1) stimulate the student's interest and enthusiasm in following the lesson attentively, (2) motivate the student to study diligently, (3) help the teacher in transferring and explaining the lesson, (4) help the teacher in achieving the intended learning goals, (5) improving and sharpening the student's knowledge and understanding towards the subject being taught, (6) increase the student's, (7) stimulate the student's emotion and attitude, and (8) accommodate the slow learners in receiving and understanding the subject's content knowledge.

The learning media has some benefits that are (1) to distribute the message from the teacher to the students, (2) to create the meaningful learning experiences, (3) to reduce the teaching time, (4) to increase the instructional quality, (5) to make the learning process possible everywhere and anywhere, (6) to increase the students' positive attitude towards the subject, and (7) to change the teacher's role from giver to facilitator or to make more positive and better roles (Munadi, 2013).

Research Method

The research's type used was Research and Development (R & D) with the use of ADDIE development model. The research's subjects were two media experts (i.e. two validators from chemistry education department) and 20 students of class X MIPA 2 which consists of 8 female and 12 male students. These study subjects were collected through purposive sampling technique that is sample determination technique with certain consideration (i.e. research time, topic being studied, and the capability level of students).

The data was collected through the use of media expediency questionnaire, observation, the cognitive test (i.e. pre-test and post-test), and students' response questionnaire. The research's instrument used were media expediency questionnaire

sheet, students' activity observation sheet (i.e. observation sheet regarding the process of the game and each student whole score when answering the queries), test (consists of 10 multiple choice questions), and students' response questionnaire sheet (consists of 10 statements). These all instruments were all validated beforehand. After the data were obtained, they were analysed by using quantitative and qualitative descriptive analysis techniques (Arikunto & Jabar, 2010).

Results and Discussion

This section is presented according to ADDIE (i.e. Analysis, Design, Development, Implementation, and Evaluation) development model phases, observation result, learning outcome test, and students' response questionnaire. The more detail explanations were as follows:

Analysis Phase

In this phase, it was done by collecting the information regarding the learning media that the teacher ever used in the class. This information was obtained through student' need analysis questionnaires and interview with one chemistry teacher. This was carried out in order to know the problem happened in school.

Based on the information gained from student's need analysis questionnaires, they found that during the learning process, the teacher had not ever used learning media instead of speech method and group discussion. Therefore, the students felt less motivated to learn and considered chemistry as a difficult subject. They also hoped that in learning chemistry, the teacher could use fun learning media which made them active and help them understand chemistry better especially in the compound's nomenclature subject.

Based on the data obtained from interviewing a chemistry teacher at SMAN 16 Banda Aceh, it was known that the learning media that the teacher had ever used were *tarek lotre* game media and power point media. However, the teacher had not ever applied them in class X MIPA 2. This was due to this teacher was just recently assigned to teach at this class. Therefore, the researcher developed *snake ladder* game media for compound's nomenclature concept. This media was chosen because of the familiarity of the game so that it can facilitate the students in operating it. It was hoped that this media can create active, joyful, and inmonotonous learning experiences so that the students' saturation could be reduced.

Design Phase

This phase is when the researcher produces a learning media product. The aim of designing *snake ladder* game media was to attract the students' interest and motivation, and to facilitate the students to understand the subject so that it can improve their learning outcome as it was hoped. The steps in designing this game are (1) designing *snake ladder* game board, (2) making box, (3) choosing colour, (4) choosing snake and ladder picture, and (5) making number. This design phase was done by using *Corel Draw X7* software. The early design of *snake ladder* game board can be seen in Figure 1 below.

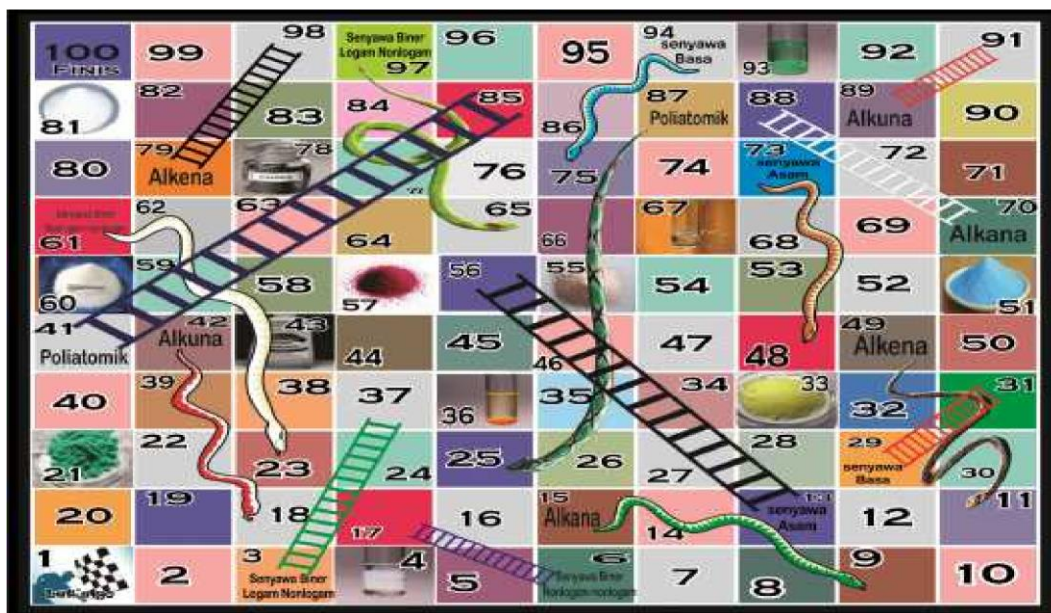


Figure 1. The early (first) design of *snack ladder* game board

This design was then consulted with the two validators to get suggestion and correction. The suggestions from validators were to combine the game rules in the *snack ladder* game board. Based on this, the board game was redesigned to get another suggestion. The second suggestion was there was unclear rules and inappropriate language according to Indonesian language. The researcher then designed 10 snake and 10 ladder queries cards in different colour for each eight indicator so that all together there was 160 queries.

Development Phase

This phase aim was to produce the expediency media for used in the instructional process. The developed components were (1) *snake ladder* game board that can be seen in Figure 2, (2) the queries card that have been revised consist of eight snake and eight ladder queries cards in different colour for each eight indicator so that all together there was 128 queries, (3) five different game pawns, (4) dice and dice shaker, (5) media validation.

The three aspects that should be evaluated or validated namely media format, visual, and media clarity in presenting the questions. The average percentage of each aspect had a score of 100% which was in very proper category. This was in accordance with the study conducted by Pramita and Rudiana (2016) who argued that *snake ladder* game media was proper to be used as a learning tool in teaching hydrocarbon as it gave average percentage of visual aspect of 85%, clarity aspect in presenting queries of 93%, and the average percentage of quality aspect of *snake ladder* media according to the students' response was 93%.



Figure 2. Snake ladder game media after revision

Implementation Phase

The implementation of *snake ladder* game media on the subject of compound's nomenclature was conducted at 19 April 2017 in class X MIPA 2 with the hope that the students can be motivated and be easier in understanding the concepts. In applying the game, the students were divided into four groups of five students who were chosen heterogenous. There were 4 observers in who each of them observed one group of students. The playing time was 60 minutes. The winner in each group was the student who both got the highest score and who finished faster.

Evaluation Phase

This was the final phase of ADDIE development model. This was done by giving post-test in order to analyse the students' performance and by distributing the questionnaire in order to find out the students' response regarding the expediency of the *snake ladder* game media as a learning tool.

Observation Result

The students' observation result was determined by the students' answer sheet during playing the *snake ladder* game. The students' score was obtained according to the number of questions that they could answer whether in the form of own query or friend's toss queries. The highest score in the first group was gotten by AD (60), while for the second, the third, and the fourth group were 50 (SA), 40 (AZ), and RZ (40) respectively.

Learning Outcome Test

After the implementation of *snake ladder* game media, the students then were given post-test to evaluate their learning outcome. Before this, they were given pre-test in the first meeting. The students' percentage score during pre-test and post-test were given in Figure 3 below.

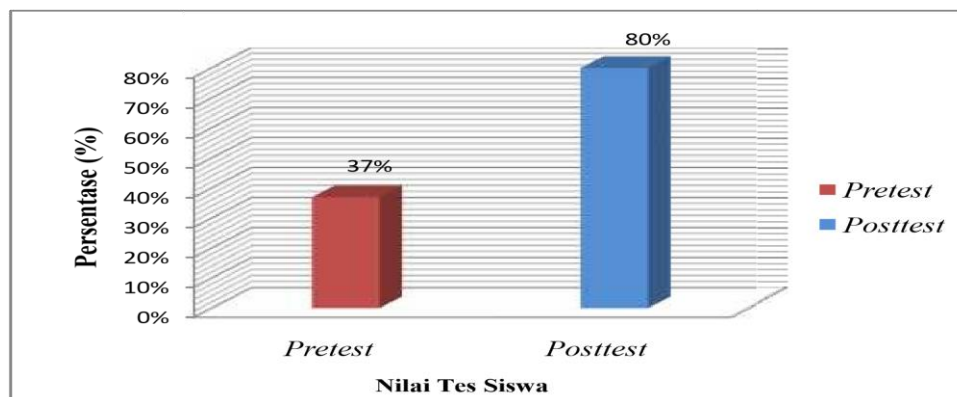


Figure 3. The percentage graphic of the students' pre-test and post-test score.

Based on Figure 3, it was known that the average percentage of students' pre-test score was 37%. It means that there was only 3 out of 20 students who achieved complete score (i.e. 60 or more) whilst there was 16 out of 20 students who achieved this score in post-test which was contributed to 80% classically. AD (the first group winner) got a score of 60 during the game. He also got the highest score during post-test. This was also happened to SA (the second group winner), AZ (the third group winner), and RZ (the fourth group winner). They obtained higher score during post-test that were 80, 70, and 70 in a row. It means that, their learning outcome was increased. Thus, it can be concluded that learning while playing can assist the students to learn the concept of compound's nomenclature better. This result was in line with the study result of Mursiti, Achmad, and Dianto (2009) who argued that there was an effect of the implementation of *snake ladder* game on the topic of redox reaction towards the students' learning outcome that was shown by correlation score of 0.56, with the effect of 31%. They continued by saying that the average score of experimental class (69) was higher than control class (59). Furthermore, Thaibin, Eny, and Ira (2013) stated that the text book equipped by chemistry *snake ladder* game media was very proper to be used and could increase the students' performance especially in teaching the concept of additive substance and psychotropic.

Students' Response Questionnaire

The students' response towards the *snake ladder* game media can be seen in Figure 4 below.

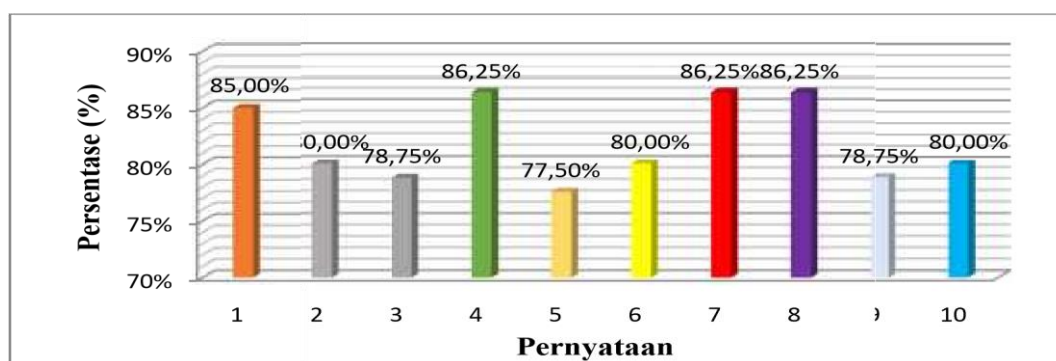


Figure 4. Graphic percentage score of the students' response.

Figure 4 shown that the average percentage of students' score for the first until the tenth statement were 85%, 80%, 78.75%, 86.25%, 77.50%, 80%, 86.25%, 86.25%, 78.75%, and 80% respectively. The lowest percentage score of the students' response was for the fifth statement while for the rest statements they gave positive responses. It means that as a whole the average percentage for all

statements was 81.87% which was categorized as very good. This result was in accordance with the study result by Kartikaningtyas, Dwi, and Stephani (2014) who argued that the students given very positive response for the implementation of SETS vision *snake ladder* game on the concept of energy in the science learning.

Conclusion

Based on the research result, it can be concluded that 1) the average percentage of media expediency questionnaire sheet from two validators was 100% which was in very proper category, (2) classically, the percentage of students' who gained mastery level was 80%, and 3) the average percentage of students' response was 81,87% within very well category. In regards to the limitation of this study was it should be better if the number of validator who validate the *snake ladder* game media was increased by adding the chemistry teachers at SMAN 16 Banda Aceh. In addition, it is better if there is an odd number of validators (3 or 5, etc) involved in the study so that the validity can be attained more accurately.

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